Developmental Biology

An International Journal Published under the Auspices of the Society for Developmental Biology

EDITOR-IN-CHIEF: Peter J. Bryant

ASSOCIATE EDITORS

Merton Bernfield
Ira B. Black
Scott E. Fraser
John C. Gerhart
Corey S. Goodman
H. Robert Horvitz
Laurinda A. Jaffe
Nicole Le Douarin
William F. Loomis
Anne McLaren
Elliot Meyerowitz
Bjorn R. Olsen
Bruce M. Paterson
Ralph Quatrano
Rudolf A. Raff
Davor Solter
Victor D. Vacquier
Virginia Walbot
Lewis Wolpert

EDITORIAL ASSISTANT: Jayne M. Sutton

ADVISORY EDITOR
Anthony P. Mahowald

VOLUME 118, 1986

ACADEMIC PRESS, INC.

San Diego Orlando New York Austin Boston
London Sydney Tokyo Toronto

Copyright © 1986 by Academic Press, Inc.

All Rights Reserved

No part of this publication may be reproduced or transmitted in any form, or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (27 Congress Street, Salem, Massachusetts 01970), for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1986 articles are as shown on the article title pages; if no fee code appears on the title page, the copy fee is the same as for current articles.

0012-1606/86 $3.00

MADE IN THE UNITED STATES OF AMERICA

Contents of Volume 118

NUMBER 1, NOVEMBER 1986

Full Papers

GRAHAM YOUNG, SHINJI ADACHI, AND YOSHITAKA NAGAHAMA. Role of Ovarian Thecal and Granulosa Layers in Gonadotropin-Induced Synthesis of a Salmonid Maturation-Inducing Substance (17α,20β-Dihydroxy-4-pregnen-3-one) 1

THOMAS M. WILKIE, RALPH L. BRINSTER, AND RICHARD D. PALMITER. Germline and Somatic Mosaicism in Transgenic Mice 9

DENIS ALLEMAND, GUY DE RENZIS, PATRICK PAYAN, AND JEAN-PIERRE GIRARD. Regulatory and Energetic Role of Na^+ in Amino Acid Uptake by Fertilized Sea Urchin Eggs 19

NORBERT PERRIMON AND ANTHONY P. MAHOWALD. *l(1)hopscotch*, a Larval-Pupal Zygotic Lethal with a Specific Maternal Effect on Segmentation in *Drosophila* 28

HIROSHI ABE, TOHRU KOMIYA, AND TAKASHI OBINATA. Expression of Multiple Troponin T Variants in Neonatal Chicken Breast Muscle 42

PAULINE SCHAAP, MICHIEL M. VAN LOOKEREN CAMPAGNE, ROEL VAN DRIEL, WOUTER SPEK, PETER J. M. VAN HAASTERT, AND JOHAN PINAS. Postaggregative Differentiation Induction by Cyclic AMP in *Dictyostelium:* Intracellular Transduction Pathway and Requirement for Additional Stimuli 52

LAURIE STEPHENS, JEFFREY HARDIN, RAY KELLER, AND FRED WILT. The Effects of Aphidicolin on Morphogenesis and Differentiation in the Sea Urchin Embryo 64

RUDOLF WINKLBAUER. Cell Proliferation in the Ectoderm of the *Xenopus* Embryo: Development of Substratum Requirements for Cytokinesis 70

LYNN M. RIDDIFORD, ANNETTE BAECKMANN, ROBERT H. HICE, AND JOHN REBERS. Developmental Expression of Three Genes for Larval Cuticular Proteins of the Tobacco Hornworm, *Manduca sexta* 82

H. OKADA, Y. HIROTA, R. MORIYAMA, Y. SAGA, AND K. YANAGISAWA. Nuclear Fusion in Multinucleated Giant Cells during the Sexual Development of *Dictyostelium discoideum* 95

JEFFREY M. DAVIDSON, KENNETH E. HILL, AND JUDITH L. ALFORD. Developmental Changes in Collagen and Elastin Biosynthesis in the Porcine Aorta 103

ROBERT A. KOSHER, STEVEN W. GAY, JOYCE R. KAMANITZ, WILLIAM M. KULYK, BARBARA J. RODGERS, S. SAI, T. TANAKA, AND MARVIN L. TANZER. Cartilage Proteoglycan Core Protein Gene Expression during Limb Cartilage Differentiation 112

THOMAS G. HONEGGER. Fertilization in Ascidians: Studies on the Egg Envelope, Sperm and Gamete Interactions in *Phallusia mammillata* 118

FAY M. HANSEN-SMITH. Formation of Acetylcholine Receptor Clusters in Mammalian Sternohyoid Muscle Regenerating in the Absence of Nerves 129

KAREN L. BENNETT AND SAMUEL WARD. Neither a Germ Line-Specific nor Several Somatically Expressed Genes Are Lost or Rearranged during Embryonic Chromatin Diminution in the Nematode *Ascaris lumbricoides* var. *suum* 141

ROBERT E. HINKLEY, BRENT D. WRIGHT, AND JOHN W. LYNN. Rapid Visual Detection of Sperm-Egg Fusion Using the DNA-Specific Fluorochrome Hoechst 33342 148

FRANK J. LONGO, JOHN W. LYNN, DAVID H. MCCULLOH, AND EDWARD L. CHAMBERS WITH THE TECHNICAL ASSISTANCE OF FREDERICK SO. Correlative Ultrastructural and Electrophysiological Studies of Sperm-Egg Interactions of the Sea Urchin, *Lytechinus variegatus* 155

FRANÇOISE CORMIER, PAULINO DE PAZ, AND FRANÇOISE DIETERLEN-LIÈVRE. *In Vitro* Detection of Cells with Monocytic Potentiality in the Wall of the Chick Embryo Aorta 167

JOSEF FULKA, JR., JAN MOTLÍK, JOSEF FULKA, AND NICOLE CROZET. Activity of Maturation Promoting Factor in Mammalian Oocytes after Its Dilution by Single and Multiple Fusions 176

G. Cossu, M. I. Senni, F. Eusebi, D. Giacomoni, and M. Molinaro. Effect of Phorbol Esters and Liposome-Delivered Phospholipids on the Differentiation Program of Normal and Dystrophic Satellite Cells ... 182

Thomas G. Wilson and Judit Fabian. A *Drosophila melanogaster* Mutant Resistant to a Chemical Analog of Juvenile Hormone ... 190

Norka Ruiz-Bravo and William J. Lennarz. Isolation and Characterization of Proteolytic Fragments of the Sea Urchin Sperm Receptor that Retain Species Specificity 202

Ulrike Dohrmann, David Edgar, Michael Sendtner, and Hans Thoenen. Muscle-Derived Factors that Support Survival and Promote Fiber Outgrowth from Embryonic Chick Spinal Motor Neurons in Culture ... 209

P. Sonderegger, P. F. Lemkin, L. E. Lipkin, and P. G. Nelson. Coordinate Regulation of the Expression of Axonal Proteins by the Axonal Microenvironment ... 222

Paul Martin and Julian Lewis. Normal Development of the Skeleton in Chick Limb Buds Devoid of Dorsal Ectoderm ... 233

Walter J. Costello and Robert J. Wyman. Development of an Indirect Flight Muscle in a Muscle-Specific Mutant of *Drosophila melanogaster* ... 247

Shun-ichi Miyazaki, Naohiro Hashimoto, Yasuaki Yoshimoto, Takeo Kishimoto, Yukio Igusa, and Yukio Hiramoto. Temporal and Spatial Dynamics of the Periodic Increase in Intracellular Free Calcium at Fertilization of Golden Hamster Eggs ... 259

R. P. Tucker and C. A. Erickson. Pigment Cell Pattern Formation in *Taricha torosa:* The Role of the Extracellular Matrix in Controlling Pigment Cell Migration and Differentiation ... 268

James R. Bartles and Ann L. Hubbard. Preservation of Hepatocyte Plasma Membrane Domains during Cell Division *in Situ* in Regenerating Rat Liver ... 286

Paul D. Benya and Silvia R. Padilla. Modulation of the Rabbit Chondrocyte Phenotype by Retinoic Acid Terminates Type II Collagen Synthesis without Inducing Type I Collagen: The Modulated Phenotype Differs from That Produced by Subculture 296

Brief Notes

Kaoru Niki and Katsutoshi Yoshizato. An Epidermal Factor which Induces Thyroid Hormone-Dependent Regression of Mesenchymal Tissues of the Tadpole Tail ... 306

Bruce Mendelson and Charles B. Kimmel. Identified Vertebrate Neurons that Differ in Axonal Projection Develop Together ... 309

Karen M. Mearow and C. K. Govind. Selective Degeneration of Fast Muscle during Claw Transformation in Snapping Shrimps ... 314

Ronald W. Lennox. Murine Erythroblasts Do Not Contain Histone H1° ... 319

Number 2, December 1986

Full Papers

Michael Solursh, Susan Lenoch Mitchell, and Hideki Katow. Inhibition of Cell Migration in Sea Urchin Embryos by β-D-Xyloside ... 325

Michael T. Crow and Frank E. Stockdale. The Developmental Program of Fast Myosin Heavy Chain Expression in Avian Skeletal Muscles ... 333

C. J. Hubbard. Cyclic AMP Changes in the Component Cells of Graafian Follicles: Possible Influences on Maturation in the Follicle-Enclosed Oocytes of Hamsters ... 343

Shin Togashi, Satoru Kobayashi, and Masukichi Okada. Functions of Maternal mRNA as a Cytoplasmic Factor Responsible for Pole Cell Formation in *Drosophila* Embryos ... 352

Marie Goudeau and Henri Goudeau. The Resumption of Meiotic Maturation of the Oocyte of the Prawn *Palaemon serratus* Is Regulated by an Increase in Extracellular Mg^{2+} during Spawning ... 361

Henri Goudeau and Marie Goudeau. External Mg^{2+} Is Required for Hyperpolarization to Occur in Ovulated Oocytes of the Prawn *Palaemon serratus* ... 371

Daniel Bachiller and Lucas Sánchez. Mutations Affecting Dosage Compensation in *Drosophila melanogaster:* Effects in the Germline ... 379

René J. W. De Wit and Tobias F. Rinke De Wit. Developmental Regulation of the Folic Acid Chemosensory System in *Dictyostelium discoideum* 385

Gary Ciment, Bengt Glimelius, Diane M. Nelson, and James A. Weston. Reversal of a Developmental Restriction in Neural Crest-Derived Cells of Avian Embryos by a Phorbol Ester Drug 392

Michael Caudy and David Bentley. Epithelial Cell Specialization at a Limb Segment Boundary in the Grasshopper Embryo 399

A. R. Howlett, G. M. Hodges, and C. Rowlatt. Epithelial–Stromal Interactions in the Adult Bladder: Urothelial Growth, Differentiation, and Maturation on Culture Facsimiles of Bladder Stroma 403

David J. Asai. An Antiserum to the Sea Urchin 20 S Egg Dynein Reacts with Embryonic Ciliary Dynein But It Does Not React with the Mitotic Apparatus 416

Thomas F. Linsenmayer, Romaine R. Bruns, Anita Mentzer, and Richard Mayne. Type VI Collagen: Immunohistochemical Identification as a Filamentous Component of the Extracellular Matrix of the Developing Avian Corneal Stroma 425

Jerome C. Regier, Antonis K. Hatzopoulos, and Ann Cathrall Durot. Patterns of Region-Specific Chorion Gene Expression in the Silkmoth and Identification of Shared 5′ Flanking Genomic Elements 432

Thomas R. Breen and Ian M. Duncan. Maternal Expression of Genes That Regulate the Bithorax Complex of *Drosophila melanogaster* 442

Heide Schatten, Richard Cheney, Ron Balczon, Mark Willard, Christi Cline, Calvin Simerly, and Gerald Schatten. Localization of Fodrin during Fertilization and Early Development of Sea Urchins and Mice 457

Keita Ohsumi, Atsunori Shinagawa, and Chiaki Katagiri. Periodic Changes in the Rigidity of Activated Anuran Eggs Depend on Germinal Vesicle Materials 467

Anthony A. James and Alain Vincent. The Spatial Distribution of a Blastoderm Stage-Specific mRNA from the *Serendipity* Locus of *Drosophila melanogaster* 474

A. Vincent, H. V. Colot, and M. Rosbash. Blastoderm-Specific and Read-through Transcription of the *sry* Alpha Gene Transformed into the *Drosophila* Genome 480

D. M. Gardiner, K. Muneoka, and S. V. Bryant. The Migration of Dermal Cells during Blastema Formation in Axolotls 488

Michael F. Marusich, Keyvan Pourmehr, and James A. Weston. A Monoclonal Antibody (SN1) Identifies a Subpopulation of Avian Sensory Neurons Whose Distribution Is Correlated with Axial Level 494

Michael F. Marusich, Keyvan Pourmehr, and James A. Weston. The Development of an Identified Subpopulation of Avian Sensory Neurons Is Regulated by Interaction with the Periphery 505

Lynn Landmesser and Marcia G. Honig. Altered Sensory Projections in the Chick Hind Limb following the Early Removal of Motoneurons 511

Marcia G. Honig, Cynthia Lance-Jones, and Lynn Landmesser. The Development of Sensory Projection Patterns in Embryonic Chick Hindlimb under Experimental Conditions 532

Carol Quaife, Robert E. Hammer, N. Karle Mottet, and Richard D. Palmiter. Glucocorticoid Regulation of Metallothionein during Murine Development 549

Mark Q. Martindale. The Ontogeny and Maintenance of Adult Symmetry Properties in the Ctenophore, *Mnemiopsis mccradyi* 556

M. S. Flaster, R. T. Ambron, and S. Schacher. Growth Cones Isolated from Identified *Aplysia* Neurons *in Vitro:* Biochemical and Morphological Characterization 577

Susan R. Singer and Carl N. McDaniel. Floral Determination in the Terminal and Axillary Buds of *Nicotiana tabacum* L. 587

MADELINE A. CROSBY AND ELLIOT M. MEYEROWITZ. *Drosophila* Glue Gene *Sgs-3:* Sequences Required for Puffing and Transcriptional Regulation 593

Author Index for Volume 118 608

Cumulative Author Index for Volumes 113–118 610

Cumulative Subject Index for Volumes 116–118 616

Cumulative Organism Index for Volumes 116–118 633

Features f-1

Information for Authors

Developmental Biology will publish papers containing new and significant information bearing on developmental mechanisms of general interest. Analysis of development, growth, regeneration, and tissue repair in plants and animals at the molecular, cellular, and genetic levels are topics suitable for the journal. In all areas, analytic rather than descriptive studies will be favored.

Original papers only will be considered. Submission of a manuscript implies the authors' assurance that the same work has not been and will not be nor is presently submitted elsewhere, and that its submission for publication has been approved by all of the authors and by the institution where the work was carried out; further, that any person cited as a source of personal communications has approved such citation. Explicit proof of these implied assurances may be required at the Editor's discretion. Persons considering submitting a Review should consult an editor before submission. Articles and any other material published in *Developmental Biology* represent the opinions of the author(s), and should not be construed to reflect the opinions of the Editor, the Publisher, or the Society of Developmental Biology.

Publication of a research article in *Developmental Biology* is taken to imply that the authors are prepared to distribute freely to interested academic researchers for their own use any clone (of cells or DNA or antibodies) used in the experiments that have been reported.

Authors submitting a manuscript do so on the understanding that if it is accepted for publication, copyright in the article, including the right to reproduce the article in all forms and media, shall be assigned exclusively to the Publisher. The Publisher will not refuse any reasonable request by the author for permission to reproduce any of his or her contributions to the journal.

Articles usually do not exceed 15,000 words and must be preceded by an abstract of about 200 words that should be fully intelligible by itself. Brief notes are 1500 words or less, including the bibliography, and should have an abstract of less than 100 words and a limit of one page of figures. All papers will be published in English.

Manuscripts should be concise. Full documentation of results in support of conclusions should be combined with maximum brevity compatible with clarity. The discussion section should relate the present work to previous knowledge but should not be expanded into a review of the field. The standard order of sections is: abstract, introduction, materials and methods, results, and discussion. Combined results and discussion may be used. In the manuscript, acknowledgment, references, footnotes, tables, and figure legends should follow the discussion in that order. All pages of the manuscript should be numbered consecutively and typed double-spaced throughout. Authors should provide a running title of 35 or fewer letters and spaces. Use footnotes sparingly; cite them with superscript numbers and type them on a separate sheet. With rare exceptions do not italicize for emphasis.

Abbreviations and units should be used consistently. Consult the lists published in the *Proceedings of the National Academy of Sciences (USA)*, the *Journal of Biological Chemistry*, and *Biochemistry* for standard abbreviations which need not be defined. Collect all abbreviations into a footnote and refer to it at the first use of an abbreviation. The use of units should follow the Système International. Use prefixes, e.g., μM, not 10^{-6} *M*. Note that *M* stands for molar, not mole. Use hr, min, sec, rpm, and cpm without definition, without a period, and without an "s" in the plural (i.e., 20 min).

Figures should be numbered consecutively in the order of their appearance and each should have a descriptive legend. Mark all figures with the author's name. *Line drawings* will be reduced in accordance with the complexity of the figures. Good quality prints are acceptable. The maximum size submitted should be 215 × 280 mm. *Photographs* should be submitted as actual size for reproduction, fitting column (90 mm) or page (185 mm) width. Sets of micrographs mounted on light cardboard and in combinations up to 203 × 267 mm in size are acceptable. For best reproduction, provide clear, glossy prints with adequate contrast. The magnification must be given on the photograph or in the legend. Figures that are to appear together as one plate should be mounted on cardboard or paper as close together as possible. It is important that the contrast and density of all figures mounted together be consistent. The printer will place thin white lines between the figures on each plate. Providing an overlay that indicates the most critical areas of the micrograph will aid in ensuring high-quality reproduction.

Illustrations in color can be accepted only if the authors defray the cost.

Tables should be retyped on separate pages and numbered consecutively with Arabic numerals, and each should have a concise heading.

References to the literature should be cited as: Doe (1985) has observed that . . . ; (Doe, 1985); Doe *et al.* (1980) should be used in the case of articles with more than two authors. Use suffixes a, b, etc., following the date to distinguish two or more works by the same authors in the same year (Doe, 1980a,b). Numbered references will no longer be accepted. Arrange literature citations in the bibliography according to the surname of the author, using the following styles:

Denell, R. E., and Frederick, R. D. (1983). Homoeosis in *Drosophila:* A description of the polycomb lethal syndrome. *Dev. Biol.* **97,** 34–47.

McLaren, A. (1981). "Germ Cells and Soma: A New Look at an Old Problem." Yale Univ. Press, New Haven, Conn.

Murphy, D. B. (1982). Disassembly purification and characterization of microtubule protein without glycerol. *In* "Methods in Cell Biology" (L. Wilson, ed.), Vol. 24, Part A, pp. 31–49. Academic Press, New York.

Abbreviate journal titles according to *Chemical Abstracts Service Source Index*, 1985.

Page proofs rather than galleys will be sent. This speeds production. Detailed instructions will be sent with proofs. A quick response and minimal changes on proof are imperative to maintain schedules.

Features will include announcements of meetings and courses in the field of developmental biology, and some meeting reports. Persons interested in preparing meeting reports are encouraged to contact the Editor.

To submit a manuscript, send two complete copies including illustrations to Peter J. Bryant, Editor, Developmental Biology Center, University of California, Irvine, California 92717. Telephone (714) 856-4715. In the cover letter to the Editor or on the title page of the manuscript, indicate the name, address, and telephone number of the author who should be contacted in editorial matters.